

CLO Cycle: Implementation @ FES

Dr. Sakander Hayat, FES

OBE Day (September 16, 2021)



CLOs: A quick introduction

What is a CLO?

➡ Every course has some objectives known as Course Learning Outcomes abbreviated as CLOs.

Who designs them?

➡ Course instructor while introducing the course to the FES curriculum.

➡ Use of proper action verbs following the domains of Bloom's taxonomy must be ensured.

Who approves them?

➡ Stakeholders for approving a new course with its CLOs:

➡ CLO Committee + FBS + BoS + AC

➡ Stakeholders involved in approving minor/major modifications:

➡ CLO Committee + Dean FES

Sample of CLOs (New course)

ES-304 Linear Algebra II (Fall 2021)

Pre-Requisite: MT-201

Instructor: Dr. Sakander Hayat

Office: Room G-14, FES

Extension: 2568

Email: sakander.hayat@giki.edu.pk

Discussion Hours: Pasted on office's door. Additionally, students may contact the instructor via email.

Mapping of Class Learning Outcome (CLOs) to Program Learning Outcomes (PLOs)

S. No	CLOs	PLOs	Bloom's Taxonomy
Upon completion of this course, students will be able to:			
CLO1	Solve a system of linear equations in engineering problems.	PLO1	C3 (Applying)
CLO2	Solve problems involving vector spaces and subspaces, such as linear independence, span, and basis.	PLO1	C3 (Applying)
CLO3	Apply principles of matrix algebra to linear transformations.	PLO1	C3 (Applying)

Amendment of Course Details

The following form will be used by instructors who wants to make changes or propose to make changes in their concerned course.

Course Code

Course Title _____

Proposed Changes		Yes	No
1.	Bloom's Taxonomy Level	<input type="checkbox"/>	<input type="checkbox"/>
2.	Course Learning Outcome	<input type="checkbox"/>	<input type="checkbox"/>
3.	CLO to PLO Mapping	<input type="checkbox"/>	<input type="checkbox"/>
4.	Other (Please Specify)	<input type="checkbox"/>	<input type="checkbox"/>

If the answer to any of the above questions is yes, please provide detail reasons below. Attach additional sheets if necessary. **Also Attach new and old course outline.**

Name and Signature of Instructor

Modification form

CLO Assessment

Assessment Type	Items Assessed	Assessment Tool	KPI	Assessed by	When assessed
Direct	CLOs	Quizzes, Assignments, Lab reports, Mini projects, Senior Design Project, Mid and Final exams	<p>At Instructor Level: Number of students achieving CLOs in course $\geq 70\%$</p> <p>At Student Level: Left for instructor to decide. It should not be less than 30%. If 100% students achieve all the CLOs in last two consecutive years, then the minimum cutoff maybe increased to 35%.</p>	Course & Lab Instructor	Each semester

Instructor's responsibilities:

- Go through previous course files at the start.
- If all the CLOs are being attained for last two years, then increase the threshold at student level, say, from 30% to 35%.
- Check if CLO mappings are appropriate and ensure the proper usage of actions verbs.
- Ensure implementation of the corrective actions available in the course review report.
- For the running semester, try to check CLO attainment before finals and take corrective actions accordingly.
- Do not try to ensure CLOs attainment superficially.
- Submit course file on time to help run the CQI process.

Filling in Course Review Report



Faculty of Engineering Sciences

CQI/CLO-AT/F-03 REV#01

COURSE REVIEW REPORT

(BY COURSE INSTRUCTOR AFTER COMPLETION OF COURSE)

Course No:	Course Name:
Instructor:	Semester:

CLO No.	Percentage of Students Attained (%)	KPI (See Next Page) (Yes/No)
CLO 1		
CLO 2		
CLO 3		
CLO 4		

Assessment Type: Direct (Cohort Level)

Course Instructor's Comments
Curriculum: Is the course curriculum appropriate in relation to the intended CLOs, and its compliance with the HEC and PEC approved guidelines.

Filling in Course Review Report. Cont.

Assessment: Comment on the continuing effectiveness of the assessment methods in relation to the intended CLOs.

Enhancement: Comment on implementation of changes proposed in earlier Faculty Course Review Reports.

Name and Sign

Dean's Comments

Suggested Corrective Action

Name and Sign

Notes:

1. $X \geq 70\%$ (KPI) No action needed
2. $40\% < X < 70\%$ Corrective action to be mutually decided by course instructor and Dean
3. $X < 40\%$ Corrective action to be decided by review committee (formulated by Dean FES)

Prior to filling this form, please refer to Course Assessment Sheet in course folder

CQI Process: CLO Cycle

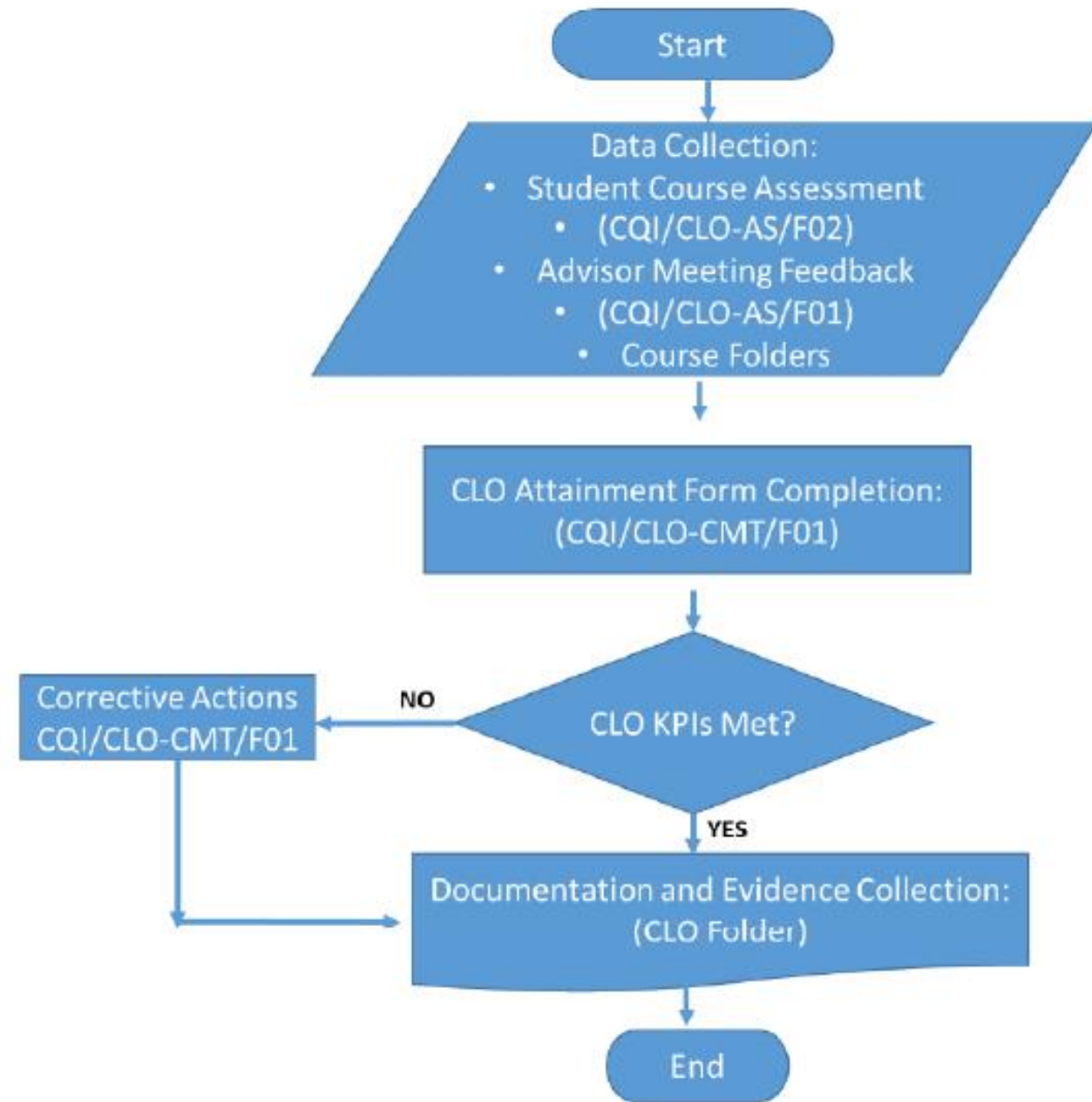


Figure: CQI Process for CLOs to be run by the CLO Committee every year

Step 1: Collection of Data

FES COURSES & LABS CLO SUMMARY

				FALL 2020				SPRING 2021			
SPRING	2	PH 102	Electricity & Magnetism					100	84	72	x
		PH 102L	Electricity & Magnetism Laboratory					98	95	98	x
		MT 102	Calculus II								
		MT 102 A	Calculus II					94	92	77	75
		MT 102 B	Calculus II					86	71	46	58
		MT 102 C	Calculus II					83	77	56	71
		MT 102 D	Calculus II					99	82	74	59
		MT 102 E	Calculus II					93	53	18	25
FALL	3	MT 201	Differential Equations& Linear Algebra I	17	38	30	x				
		ES 211	Circuit Analysis I	76	76	70	x				
		ES 211L	Circuit Analysis Lab	100	100	92	x				
		ES 212	Logic Design	82	58	84	82				
		ES 212 L	Logic Design Lab	95	95	95	x				

Recommendations for Corrective Action

CLO Committee

Using the Course Files and input from the concerned instructors, the CLO Committee shall decide the recommended corrective action for courses that do not meet KPIs.

List of Courses Not Meeting KPIs						
Course Code	Course Title	Recommendations				
		Review of CLOs	OBE Training for Instructors	Review of Assessment Methods	Review of Instructor Evaluation	Other
PH 101	Mechanics					✓
PH 103	Fundamentals of Mechanics					✓

Please provide reasons below. Attach additional sheets if necessary.

PH101, PH 103, PH 104, ES 341 & ES 472 - Previous record meets KPIs. Difference is marginal. No action necessary.

MT101, MT102, ES475 ES 212, ES 232 – The failure correlates with the disruptions caused by the transition to online mode mid-semester due to Covid-19 pandemic. Previous record meets KPIs.

MT102, MT201, ES 475 – Review of Assessment Mechanisms is suggested.

Step 2: Corrective Actions by CLO Committee

CLO Committee Members (Name and Signature)

Final Step: Dean FES

Dean's Comments
Suggested Corrective Action
Name and Sign

Notes:

1. $X \geq 70\%$ (KPI) No action needed
2. $40\% < X < 70\%$ Corrective action to be mutually decided by course instructor and Dean
3. $X < 40\%$ Corrective action to be decided by review committee (formulated by Dean FES)

Prior to filling this form, please refer to Course Assessment Sheet in course folder

Some Important Policies:

- Our policy document covers all the practices and policies regarding CLOs. Some important policies are as follows:

Assessment of Taxonomy Domains

- The evaluation of the cognitive domain is carried out in all the theory courses.
- The evaluation of the psychomotor domain is carried in all the laboratory courses.
- The evaluation of the affective domain is carried out in the following courses.

1. CH101
2. HM101
3. HM102
4. ME102
5. HM211
6. HM321
7. HM322

For further implementation it will be assessed in courses and Labs involving Projects, Complex Engineering Problem and Open-ended labs through the following mechanism.

1. Instructor will define a separate CLO related with affective domain.
2. The Course Instructor must seek the CLO Committee's approval before using the CLOs to evaluate the students. To seek approval, the Course Instructor must fill out Form and submit it along with the modified Course Outline to the head of the CLO Committee.
3. Once the CLO is approved the course instructor will develop an assessment rubric representing the affective domain.

Some Important Policies (Adding a new CLO in lab courses):

ES362L: Characterization Of Materials (1 CH)					
Lab Instructors	Engr. Dr. Muhammad Usman				
Lab Engineers	Engr. Zain Ul Abidin	Email	m.usman@giki.edu.pk		
Lab Hours	Wednesday (02:30pm to 05:30pm)		Students per workstation	02	
Batch	28	Office	G44	Extension	2718

CLO's	Course Learning Outcomes	PLO's	Bloom Taxonomy
CLO-1	To investigate optical characterization tools and techniques.	PLO4	P-3
CLO-2	To investigate thermal characterization techniques.	PLO4	P-3
CLO-3	To follow SOPs outlined on notice board of semiconductors lab.	PLO8	A-3

Some Important Policies:

Taking this matrix as our example, the CLO1 is being assessed by Quiz 1, Assignment 1, questions 1 & 4 of the midterm and questions 1, 2 & 3 of the final.

PARTICULAR	TOTAL (<i>Tentative</i>)
Quiz	20%
Assignment	5%
Mid Exam	30%
Final Exam	45%
Total	100%

Table 1: Breakdown for student assessment.

For Example. In figure 1, each quiz has five 5% weightage, assignment has 2.5%, each question of mid exam has 7.5% weightage, and each question of final exam has 9% weightage.

Assuming each quiz carries 15 marks, assignment carries 5 marks, each question of mid exam carries 5 marks, and each question of final exam carries 10 marks.

Evaluation of CLO 1:

Supposing a student scored 7 marks Q1, 3 in A1, 5 in M1 and 2 in M4, 5 in F1, 10 in F2 and 0 in F3.

$$\text{CLO1} = \left(\frac{\left(\frac{7}{15} * 5\right) + \left(\frac{3}{5} * 2.5\right) + \left(\frac{5}{5} * 7.5\right) + \left(\frac{2}{5} * 7.5\right) + \left(\frac{5}{10} * 9\right) + \left(\frac{10}{15} * 9\right) + \left(\frac{0}{10} * 9\right)}{5 + 2.5 + 7.5 + 7.5 + 9 + 9 + 9} \right) * 100$$

CLO1 = 56.222222.

Some Important Policies:

CLO Attainment

Policy for Lack of Attainment of CLO by Cohort:
For the student, the KPI for CLO attainment is 50%.

Student	Left for instructor to decide. It should not be less than 30%. If 100% students achieve all the CLOs in last two consecutive years, then the minimum cutoff maybe increased to 35%.
Instructor	If attainment: Greater than 70% <ul style="list-style-type: none">• Achieved Between 40% and 70% <ul style="list-style-type: none">• Dean to discuss sources of lack of attainment after semester. CLO Committee to review the matter in Summer as per normal course of action. Less than 40% <ul style="list-style-type: none">• CLO Committee to review the matter immediately.

Any Questions?

